UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/957,443	09/18/2001	Jason Zweiback	60901-P001CP1-10103155	2513

29053 7590 10/21/2003

DALLAS OFFICE OF FULBRIGHT & JAWORSKI L.L.P.
2200 ROSS AVENUE
SUITE 2800
DALLAS, TX 75201-2784

EXAMINER	
PRITCHETT, JOSHUA L	

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

GA

Office Action Summary	Application No. 09/957,443	Applicant(s) ZWEIBACK ET AL.	
	Examiner Joshua L Pritchett	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38 and 58-95* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38 and 58-95* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This action is in response to Amendment B filed August 4, 2003. Claims 1 and 58 have been amended as requested by the applicant.

Claim Objections

Claims 1-38 and 58-95 are objected to because of the following informalities: claims 1 and 58 have two separate occurrences of "a predetermined number" in lines 3 and 4 referring to two separate items. The first occurrence of "a predetermined number" is in relation to the number of positioning errors and the second occurrence is in relation to the average of the errors. It is unclear if "a predetermined number" is supposed to be the same number in both instances or if "a predetermined number" is a different number. If "a predetermined number" is to refer to the same number in both cases the second "a predetermined number" should be changed to "the predetermined number." If "a predetermined number" refers to two different numbers the first instance should read "a first predetermined number" and the second "a second predetermined number." Also claims 3 and 60, which refer to the predetermined number should be amended to refer to the proper instance of "a predetermined number," as should the rest of claim 1. The claim will be examined as if "a predetermined number" is meant to have different numbers for each instance. Claims 3 and 60 will be examined as referring to the predetermined number of average errors. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-8, 32, 36-37, 58-65, 89 and 93-94 are rejected under 35 U.S.C. 102(e) as being anticipated by Napier (US 6,483,965).

Regarding claims 1 and 58, Napier discloses a method of producing an optical grating comprising designing an optical pattern, a predetermined number of errors into the pattern to reduce the average of the errors to a predetermined number (Fig. 7) and recording the pattern with sufficient number of errors into an optical element (col. 2 lines 65-67). The step of designing an optical pattern is considered to be inherent to the step of writing the pattern because any writing pattern must be designed either by a person or a machine prior to or during the writing phase. As the proximity of the errors in Napier gets smaller (meaning that more errors exist within the grating) the group delay ripple error (a measure of the average error of the grating) decreases, therefore Napier discloses that the more individual errors in a grating the lower the average error of the grating. The predetermined number of errors disclosure arises from determining the number of segments that the grating will contain.

Regarding claims 2 and 59, Napier discloses writing an additional number of segments than are required by a desired design (col. 3 lines 9-13). Napier discloses the use of a first phase mask to create a second phase mask rather than writing onto the optical fiber, the use of a second phase masks inherently means that an additional number of segments are written than are required initially.

Regarding claims 3 and 60, Napier discloses the predetermined number is zero (Fig. 7; col. 8 lines 34-35). Fig. 7 shows that as the proximity of errors increases the group delay decreases therefore as the errors become infinitely close together the group delay will inherently become zero.

Regarding claims 4 and 61, Napier discloses the optical element is a mask and the mask is used to form the grating (col. 3 lines 9-13).

Regarding claims 5 and 62, Napier discloses exposing the mask with at least one beam (col. 3 lines 18-19).

Regarding claims 6 and 63, Napier discloses the errors being stitching errors and the group delay ripple error of the grating is decreased with the number of stitching errors increasing (Fig. 7; col. 4 lines 17-18). Line placement errors are inherently considered to be the same thing as stitching errors.

Regarding claims 7 and 64, Napier discloses the pattern includes information associated with one of linear and non-linear chirp (col. 5 lines 38-42).

Regarding claims 8 and 65, Napier discloses inducing a plurality of stitching errors into the pattern (col. 5 lines 44-45).

Regarding claims 32 and 89, Napier discloses writing a plurality of a least one geometrical shape (Fig. 3).

Regarding claims 36 and 93, Napier discloses the optical element is a fiber and the step of recording forms a grating in the fiber (col. 4 line 31).

Regarding claims 37 and 94, Napier discloses a group delay ripple error of the grating is decreased as the number of errors is increased (Fig. 7). Napier discloses that as the proximity of the errors increase (meaning that more errors exist in the grating) the group delay ripple decreases.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 9-10, 17-20, 66-67 and 74-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Napier in view of Clements (US 6,084,995).

Regarding claims 9 and 66, Napier teaches the invention as claimed but lacks reference to having different periods in the grating. Clements teaches the use of having different periods in the grating (Fig. 2) by modifying the scaling factor (col. 4 lines 9-11). Varying the period

according to a rule is considered inherently the same as adjusting a scaling factor. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the grating of Napier have different periods as taught by Clements for the purpose of using the grating to effect several different polarizations of the incident light.

Regarding claims 10 and 67, Napier teaches the invention as claimed but lacks reference to each segment having an arbitrary period. Clements teaches each segment having an arbitrary period (col. 4 lines 9-11). Varying the period randomly is considered inherently the same as each segment having an arbitrary period. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Napier grating have an arbitrary period in each segment as taught by Clements for the purpose of using the grating to effect several different polarizations of incident light.

Regarding claims 17-20 and 74-77, Napier teaches the invention as claimed but lacks reference to subsegments. Clements teaches that each segment (1, 2 and 3; Fig. 2) as within it several different possibilities for subsegments. Segment 1 teaches each subsegment has the same period. Segment 2 teaches that a segment can have a different period than the previous segment (Segment 1) and that difference can be either increasing or decreasing of the period. Segment 3 teaches that subsegments can be arbitrary as there is no pattern present in subsegments of segment 3. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Napier invention have subsegments with a variety of characteristics as taught by Clements for the purpose of increasing the applicability of the invention and to induce more errors which would decrease the group ripple delay.

Claims 11-16, 21-26, 34-35, 68-73, 78-83 and 91-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Napier in view of Lee (US 5,909,313).

Regarding claims 11 and 21 and 68 and 78, Napier teaches the invention as claimed but lacks reference to adjusting the location of bars and edges to correspond to pixel locations. Lee teaches the adjustment of the location of bars and edges to correspond to pixel locations (col. 5 lines 16-18). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Napier invention have the grating adjustable as taught by Lee for the purpose of creating a coherent picture.

Regarding claims 12 and 22 and 69 and 79, Napier teaches the invention as claimed but lacks reference to pixel location corresponding to a periodic grid. Lee teaches the pixel location corresponding to a period grid (Fig. 1A). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Napier invention have the pixel location correspond to a periodic grid as taught by Lee for the purpose of creating a coherent picture.

Regarding claims 13-14 and 23-24 and 70-71 and 80-81, Napier teaches the invention as claimed but lacks reference to period grid size. Lee teaches the size of the periodic grid being less than 9 microns (col. 5 lines 13-14). It has been held that it is within the skill of one of ordinary skill in the art to change the size of an object. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Napier invention have the periodic grid have as taught by Lee with the claimed size limitations for the purpose of creating a clear and coherent picture.

Regarding claims 15-16 and 25-26 and 72-73 and 82-83, Napier teaches the invention as claimed but lacks reference to adjusting the desired location of each pixel. Lee teaches the

adjustment of the desired location of each pixel (col. 5 lines 15-18). It is inherent that the pixel can only be adjusted up to half of a pixel spacing, because to adjust a pixel more than half a spacing would mean the pixel could have been moved in another direction a distance less than half a spacing to have the pixel fit neatly into the periodic grid. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Napier invention have the pixel adjustable as taught by Lee for the purpose of creating a coherent picture.

Regarding claims 34 and 35 and 91 and 92, Napier teaches the invention as claimed but lacks reference to the small size of the writing grid. Lee teaches the writing grid size less than 10 nm (col. 5 lines 13-14). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Napier invention have the writing grid size as taught by Lee for the purpose of creating a clear and coherent picture.

Claims 27-31, 33, 84-88 and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Napier in view of Kurihara (US 6,466,714).

Regarding claims 27-28 and 31 and 84-85 and 88, Napier teaches the invention as claimed but lacks reference to the use of raster e-beams to write the grating. Kurihara teaches the use of a raster e-beam to write an optical grating (col. 4 line 55). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Napier grating written by raster e-beam as taught by Kurihara for the purpose of repeated writing the grating over the length of the optical element.

Regarding claims 29 and 86, Napier teaches the invention as claimed but lacks reference to the use of multiple e-beams. Kurihara teaches the use of multiple e-beams (col. 5 line 3). The

number of 24 e-beams seems to be arbitrarily chosen and therefore the examiner believes than any person of ordinary skill in the art could make the number of multiple e-beams of Kurihara equal 24. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Napier invention have multiple e-beams as taught by Kurihara for the purpose of redundancy to increase the reliability of the grating produced.

Regarding claims 30 and 87, Napier teaches repeating the writing step for multiple exposures (col. 3 lines 9-13). The use of two masks inherently means the writing step must be repeated for multiple exposures.

Regarding claims 33 and 90, Napier teaches the invention as claimed but lacks reference to repositioning the writing equipment for subsequent fields. Kurihara teaches repositioning the writing equipment for subsequent fields (col. 5 lines 3-4). Kurihara discloses a movable writing stage (5). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Napier writing equipment move for each subsequent field as taught by Kurihara for the purpose of maintaining a consistent direction and angle of incident from the writing beam with respect to the location of the optical element.

Claims 38 and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Napier in view of Starodubov (US 6,344,298).

Napier teaches the invention as claimed but lacks reference to the use of a phase shift in the grating. Starodubov teaches the use of a phase shift in the grating (col. 5 lines 30-32). It would have been obvious to a person of ordinary skill in the art at the time the invention was

claimed to have the Napier grating contain phase shifts as taught by Starodubov for the purpose of having the mask have equally strong resonance peaks.

Response to Arguments

Applicant's arguments, see Amendment B, filed August 4, 2003, with respect to the rejection(s)of claim(s) 23-24 and 70-71 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Napier in view of Lee.

Applicant's arguments filed August 4, 2003 have been fully considered but they are not persuasive.

On page 14 of Amendment B, applicant argued that Napier does not teach more individual errors lowering the average error. The examiner disagrees; Napier shows that as the proximity of errors decreases the average error decreases thus leading to the inherent idea of having a greater number of errors. The greater number of errors results from having a shorter distance between errors while keeping the overall length of the grating constant.

On page 15 of Amendment B, applicant argues that Napier does not teach additional number of segments than required. The examiner disagrees; Fig. 7 of Napier shows that as the error proximity decreases the average error decreases. Therefore the number of segments would increase with the introduction of more errors in closer proximity because errors occur at the edge of a segment and to create a grating of the same length with less average error one would need to

decrease the proximity of the errors thereby creating shorter segments which leads to the need for a greater number of segments.

On page 15 of Amendment B, applicant argues that Fig. 7 of Napier is graph of a function of the error size not the error proximity. The examiner disagrees; Napier states Fig. 7 is a graph of the group delay as "a function of the line placement error," which the examiner takes to mean the location of the errors relative to one another.

On page 15 of Amendment B, applicant argues that Napier stitching errors are unintentional. The claims do not stat the use of intentional errors; further it is known that errors occur at the overlap of two segments so by using multiple segments one knows that some error will occur. Therefore using multiple segments means that an error has been intentionally introduced.

On page 16 of Amendment B, applicant argues that Napier lacks writing geometrical shapes. The examiner disagrees; Napier teaches writing line segments (col. 4 lines 11-13) which are geometrical shapes.

On page 16 of Amendment B, applicant argues Clements does not teach the proper scaling factor, and that the scaling factor should be a manufacture tool. There are no claim limitations that require the use of a manufacture tool to create the scaling factor, thus the rejection is viewed as proper by the examiner.

On page 17 of Amendment B, applicant argues that there is no motivation to combine Clements and Napier. The examiner disagrees; both Napier and Clements are equipment for writing gratings in an optically transmissive material. A person of ordinary skill in the art would recognize that the teachings of one are related to the teachings in the other.

On page 17 of Amendment B, applicant argues that Clements subsegments are not the same as in the current invention. The examiner disagrees; the Clements subsegments meet the broadest reasonable interpretation of the claimed language. One of ordinary skill in the art would recognize that Clements contains subsegments.

On page 18 of Amendment B, applicant argues that Napier's multiple exposures is not the same as in the current invention. The examiner disagrees; the Napier multiple exposures meet the broadest reasonable interpretation of the claimed language. One of ordinary skill in the art would recognize that Napier contains multiple exposures.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L Pritchett whose telephone number is 703-305-7917. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A Dunn can be reached on 703-305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JLP

DREW DUNN
SUPERVISORY PATENT EXAMINER